

REMARKS

Reconsideration and allowance of the above-identified application are respectfully requested.

Claims 1-18 are currently pending, wherein claims 1, 3, 7, 8, 12, 13, 14, 15, 17 and 18 are independent. Claims 3 and 15 have been amended. Claims 19-46 have been canceled. Applicant reserves the right to file divisional applications to the non-elected claims.

Claim 15 has been amended merely to correct a trivial spelling error. This amendment does not narrow or otherwise limit the scope of the claim, and is not made for any purpose related to patentability. The amendment is fully supported by the present application, and no new matter has been introduced by way of this amendment.

Applicant notes with appreciation the acknowledgment by the Patent Office of the Information Disclosure Statements previously submitted to the Patent Office on March 16, 2001.

Applicant further notes with appreciation the characterization of claims 3-6 as allowable if rewritten in independent form. Applicant hereby amends claim 3 merely to write the claim in independent form, including all of the features of the base claim and any intervening claims. This amendment does not narrow or otherwise limit the scope of the claims, and is not made for any purpose related to patentability. No new matter has been introduced by way of this amendment. It is respectfully submitted that independent claim 3 is allowable, as well as dependent claims 4-6 that depend from independent claim 3.

Applicant would like to thank Examiner Tan Mai for the personal interview conducted on February 23, 2005. In compliance with M.P.E.P. § 713.04, the substance of

that interview is incorporated in the foregoing amendments to the claims and in the following remarks.

In the second section of the Office Action, claims 8-11 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. These rejections are respectfully traversed.

The Patent Office asserts that claim 8 allegedly “fails to recite the necessary detail physical structures to perform the recited function(s) nor are there any recitation describing how such an apparatus (or elements) is actually provided in the FIR filter.” [Office Action, page 2] In particular, the Patent Office alleges that “[t]he claims are incomplete in that they recite only a portion of the methodology required for the FIR filter to become operational, i.e., they omit essential elements and/or steps.” [Office Action, page 2] It is respectfully submitted that the Patent Office is misconstruing and misinterpreting the claims, and that there is no requirement under U.S. patent law or rules to recite every feature of an invention in a claim.

With respect to the mandates of 35 U.S.C. § 112, second paragraph, it is a fundamental principle that “the definiteness of the language must be analyzed, not in a vacuum, but always in light of the teachings of the disclosure as it would be interpreted by one of ordinary skill in the art.” [M.P.E.P. § 2106; *see also* M.P.E.P. § 2173.02] The test for definiteness under 35 U.S.C. § 112, second paragraph is whether “those skilled in the art would understand what is claimed when the claim is read in light of the specification.” [M.P.E.P. § 2173.02] However, there is *absolutely no* requirement that every feature of an invention, both new *and* old, must be recited in a claim. For example, according to M.P.E.P. § 2106,

Applicant's claims, interpreted in light of the disclosure, must reasonably apprise a person of ordinary skill in the art of the invention. However, the applicant need *not* explicitly recite in the claims every feature of the invention. For example, if an applicant indicates that the invention is a particular computer, *the claims do not have to recite every element or feature of the computer*. In fact, *it is preferable for claims to be drafted in a form that emphasizes what the applicant has invented* (i.e., what is new rather than old). [M.P.E.P. § 2106 (citations omitted) (emphasis added)]

It is respectfully submitted that Applicant has recited claims that emphasize what the Applicant has invented (i.e., what is new rather than old). The present invention is directed to an FIR filter in which the delay of one or more stages is selectable or adjustable with respect to the other stages so that filtering of a portion of the input signal can be skipped. According to the present application,

[b]y virtue of this arrangement, since the delay of one stage is adjustable, it is possible to "skip" areas of the input signal that are known to have negligible signal level relative to other areas of the input signal. That is, the portion of the input signal may be delayed by a variable period before being injected into a predetermined block of FIR stages thus "skipping" over the irrelevant portions of the signal. Since the entire input signal does not need to be injected into FIR stages, fewer stages are required to filter the input signal. [present application, page 4, line 32 – page 5, line 16]

Accordingly, claim 8 of the present application recites a FIR filter. The FIR filter includes "a plurality of delay elements." The FIR filter includes "a plurality of coefficient taps, each associated with a portion of an input signal in corresponding stages of delay from a corresponding delay element." Claim 8 further recites that "at least one delay element has a period of delay that is selectable." It is respectfully submitted that claim 8 recites a proper interrelationship of elements that define Applicant's invention and "reasonably apprise[s] a person of ordinary skill in the art of the invention" of what is claimed, in complete compliance with the mandates of 35 U.S.C. § 112, second paragraph.

During the interview, the Patent Office clarified its position. The Patent Office stated that since the preamble of claim 8 recites a "FIR filter," then the body of the claim must recite every feature of an FIR filter, including multipliers, adders, inputs, outputs and the like, which the Patent Office asserts are allegedly "essential" to the invention. Applicant does not disagree with the Patent Office that a FIR filter includes numerous elements. The specification of the present application discloses the features of an FIR filter according to exemplary embodiments in, for example, Figures 5a and 5b, and from page 14, line 17 to page 16, line 30. However, as noted above, there is absolutely no requirement that all of those "old" features must be included in claim 8. To require Applicant to do so has no basis in the patent law and rules and is a completely unfounded and unsupported assertion.

By requiring the Applicant to recite "the entire portion of the methodology for the FIR filter to become operational," it is respectfully submitted that the Patent Office is requiring Applicant to recite, in the claims, features of an FIR filter that are old. Such a requirement has no basis in U.S. patent laws or rules. Contrary to the assertions of the Patent Office, it is respectfully submitted that claim 8 does *not* omit essential elements and/or steps. "Breadth of a claim is not to be equated with indefiniteness." [M.P.E.P. § 2173.04] It is respectfully submitted that Applicant has drafted the claims of the present application of a proper scope that emphasizes what the Applicant has invented.

Accordingly, it is respectfully submitted that "those skilled in the art would understand what is claimed when the claim is read in light of the specification." [M.P.E.P. § 2173.03] Contrary to the assertions of the Patent Office, it is respectfully submitted that a skilled artisan would recognize the "necessary detail physical structures to perform the recited function(s)" and "how such an apparatus (or elements) is actually provided in the FIR

filter” with respect to claim 8. Consequently, it is respectfully submitted that the claims of the present application “reasonably apprise a person of ordinary skill in the art of the invention” of what is claimed. Therefore, it is respectfully submitted that the claims of the present application are in full and complete compliance with the mandates of 35 U.S.C. § 112, second paragraph. Accordingly, reconsideration and withdrawal of this ground of objection are respectfully requested.

If this rejection is repeated, the Patent Office is requested to specifically point out the patent law or rule, or section of the M.P.E.P. and the precise sentences within that section that state that every feature of an invention, both new *and* old, must be recited in a claim.

Additionally, “if the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding.” [M.P.E.P. § 2144.03] The Patent Office has alleged that “[t]he claims are incomplete in that they recite only a portion of the methodology required for the FIR filter to become operational.” [Office Action, page 2] It is respectfully submitted that the Patent Office is using “personal knowledge” regarding what supposedly constitutes a “complete” methodology required for an FIR filter to become operational. However, the Patent Office has provided absolutely no foundation or support for such a bald assertion. Applicant respectfully traverses such a use of “personal knowledge,” and requests the Patent Office provide an affidavit or declaration setting forth specific factual statements and explanations to support such a the finding, in accordance with M.P.E.P. § 2144.03.

In the fourth section of the Office Action, claims 1-2 and 7-18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Nakase et al. (U.S. Patent No. 5,222,035, hereinafter “Nakase”). This rejection is respectfully traversed.

Nakase discloses a filter circuit that includes a plurality of filter circuit units and an adder taking the sum total of their respective outputs. According to Nakase, the plurality of bits comprising the input signal are divided into a plurality of bit groups, and each bit group is processed in parallel by means of separately equipped filter circuit units respectively. [*see* Nakase, column 1, line 66 – column 2, line 4] As disclosed by Nakase, “[s]ince the number of bits of individual data is made small by the division, the operation speed of computing elements and the number of times of recursive or multiple uses of computing elements are increased so that the circuit scale of the entire filter circuit can be reduced.” [Nakase, Abstract]

More particularly, as illustrated in, for example, Figure 1, Nakase discloses a plurality of separate filter circuit units, with each filter circuit including a shift register and an arithmetic unit. “The data a_1, a_2, \dots, a_m produced by dividing a plurality of bits constituting the input digital signal a into a plurality of bit groups are inputted to the shift register . . . of separate filter circuit units respectively.” [Nakase, column 3, line 67 – column 4, line 2] “At the arithmetic unit . . . of each filter circuit unit, an operation of multiplying each corresponding tap gain to a plurality of output signals having different delay times of each stage of the shift register . . . and summing up the multiplication results is carried out n times ($n \geq 1$) in every one sampling interval $t_s (= 1/f_s)$.” [Nakase, column 4, lines 2-8]

Therefore, it is respectfully submitted that Nakase discloses a structure that is different than that recited in, for example, claim 1 of the present application. For example,

claim 1 of the present application recites the feature of “a delay coupled *between* two of said plurality of filter stages to delay application of the input signal to at least one of said filter stages to skip filtering a portion of the input signal.” Nakase discloses that a shift register is included *within* each filter circuit unit. [*see, e.g.,* Nakase, Figures 1, 5, 7, 9, and 10] It is respectfully submitted that Nakase does not disclose or suggest a delay coupled *between* two of the filter circuit units to delay application of the input signal to at least one of the filter circuit units.

In addition, according to Nakase, the *entire* input signal is processed. Each filter circuit unit receives a respective bit group of the input signal, so that the *entire* input signal is thereby filtered. [*see, e.g.,* Nakase, column 9, lines 49-51: “[t]he input signal in every 4 bits (or 5 bits) is inputted to each separate filter circuit unit.”] In complete contrast to Nakase, since the delay of one stage is adjustable, it is possible to “skip” areas of the input signal that are known to have negligible signal level relative to other areas of the input signal, in accordance with exemplary embodiments. That is, the portion of the input signal can be delayed by a variable period before being injected into a predetermined block of FIR stages thus “skipping” over the irrelevant portions of the signal. As disclosed by the present application, “the region 3 of the input signal [illustrated in Figure 1] is delayed appropriately in delay pipe 64 [illustrated in Figure 3] so that region number 3 is not subjected to echo cancellation (it is ‘skipped over’) until portion 4 can be received and input into filter block 316 [illustrated in Figure 3]. This way, *not* the entire input signal is FIR-filtered” [*present application, page 11, lines 26-32 (emphasis added)*] Therefore, it is respectfully submitted that Nakase does not disclose or suggest the feature of a delay coupled two of said

plurality of filter stages to delay application of the input signal to at least one of said filter stages *to skip filtering a portion of the input signal.*

During the interview, the Patent Office clarified its position. As acknowledged in the Office Action and by the Patent Office during the interview, Nakase does not disclose the claimed delay. However, with reference to, for example, Figure 1 of Nakase, the Patent Office baldly asserts that the invention disclosed by Nakase is allegedly capable of skipping filtering of a portion of the input signal, because each filter circuit unit includes a shift register and processes a portion of the input signal. However, the Patent Office has provided absolutely no support for its assertion. Rather, to justify its position, the Patent Office merely states that “[i]t would have been obvious to a person having ordinary skill in the art at the time the invention was made to design the claimed invention according to Nakase et al’s teachings because the device is an FIR filter having a plurality of filter stages as claimed.”

[Office Action, page 3]

According to M.P.E.P. § 2144.03,

[a]ny rejection based on assertions that a fact is well-known or is common knowledge in the art without documentary evidence to support the examiner’s conclusion should be judiciously applied. Furthermore, . . . any facts so noticed should be of notorious character and serve only to “fill in the gaps” in an insubstantial manner which might exist in the evidentiary showing made by the examiner to support a particular ground of rejection. It is *never* appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based. [M.P.E.P. § 2144.03 (emphasis added)]

Thus, “if the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding.” [M.P.E.P. § 2144.03]

It is respectfully submitted that the Patent Office is using “personal knowledge” regarding what the invention according to Nakase is capable of performing, in particular, that “the plurality of shift registers 12 are capable of providing the equivalent function of the claimed delay.” [Office Action, page 3] The Patent Office has provided absolutely no support, either implicitly or explicitly within Nakase or some other reference, for the bald assertion that the invention disclosed by Nakase is allegedly capable of skipping filtering of a portion of the input signal. Applicant respectfully traverses such a use of “personal knowledge,” and requests the Patent Office provide an affidavit or declaration setting forth specific factual statements and explanations to support such a the finding, in accordance with M.P.E.P. § 2144.03.

Additionally, according to M.P.E.P. § 2143, to establish a prima facie case of obviousness, three basic criteria must be met. “First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” [M.P.E.P. § 2143] In other words, “[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” [M.P.E.P. § 2143.01] The Patent Office has completely failed to provide any such suggestion or motivation in Nakase or “in the knowledge generally available to one of ordinary skill in the art” for its assertions. Rather, the Patent Office is using the knowledge in the present application as the motivation or suggestion to modify Nakase. Therefore, it is

respectfully submitted that the Patent Office has failed to establish a prima facie case of obviousness with respect to, for example, claim 1 of the present application.

It is respectfully submitted that the Patent Office is clearly and unequivocally using impermissible hindsight in an attempt to render the claims of the present application obvious and to justify the unfounded and baseless assertion that Nakase is capable of skipping filtering of a portion of the input signal. According to M.P.E.P. § 2142, “[t]o reach a proper determination under 35 U.S.C. 103, . . . impermissible hindsight must be avoided and the legal conclusion [of obviousness] must be reached on the basis of the facts gleaned from the prior art.” Furthermore, according to M.P.E.P. § 2143.01, “[t]he mere fact that references can be . . . modified does not render the resultant combination obvious unless the prior art also suggests the desirability of [such modification].” [citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990)] By stating that the claimed invention could be designed according to Nakase “because the device is an FIR filter having a plurality of filter stages as claimed,” it is respectfully submitted that the Patent Office has relied upon impermissible hindsight and has used the disclosure of the Applicant’s own application to modify Nakase. The Patent Office has offered no proper support or motivation for modifying Nakase, independent of Applicant’s own disclosure. It is respectfully submitted that the rejection based on obviousness is founded upon “knowledge gleaned only from applicant's disclosure.” [see M.P.E.P. § 2145] Consequently, it is respectfully submitted that the rejection entails hindsight and is, therefore, improper.

Independent claims 7, 8, 12, 13, 14, 15, 17 and 18 recite features similar to those recited in independent claim 1, and are, therefore, patentably distinguishable over Nakase for at least those reasons stated above with regard to claim 1.

For example, with respect to the rejection of independent claims 7, 8 and 13, Nakase discloses that “[i]n a filter circuit for ghost canceling shown in FIG. 13, a part of a shift register 101 and a tap selection circuit 401 can be treated as a variable delay line 102 as in a constitution shown in FIG. 14.” [Nakase, column 12, lines 9-12] However, it is respectfully submitted that the embodiments illustrated in Figures 13 and 14 of Nakase do not disclose or suggest the features of, for example, “a *first block of filter stages* having a respective first plurality of taps which receive a respective first plurality of weighting coefficients, for filtering a first portion of the input signal in accordance with the first plurality of weighting coefficients”; “a *second block of filter stages* having a respective second plurality of taps which receive a respective second plurality of weighting coefficients, for filtering a second portion of the input signal in accordance with the second plurality of weighting coefficients” and “a delay which variably delays application of the second portion of the input signal to the second block of filter stages with respect to the first portion of the input signal,” as recited in claim 7 of the present application. It is respectfully noted that the embodiment illustrated in Figure 13 of Nakase includes a *single* shift register 101 to process the *entire* video signal.

Additionally, it is respectfully noted that although the variable delay line 102 includes numerous delay elements, nowhere does Nakase disclose or suggest the feature of “at least one delay element has a period of delay that is selectable,” as recited in, for example, claim 8 of the present application. It is respectfully noted that Figure 14 illustrates that the variable delay line 102 provides a variable delay by increasing or decreasing the *quantity* of delay elements (note the ellipsis between the eighth and ninth delay elements of the variable delay line 102). It is respectfully submitted that Nakase does not disclose or suggest that one or more of the delay elements for variable delay line 102 has a period of delay that is *selectable*.

Therefore, it is respectfully submitted that Nakase does not render the subject matter of independent claims 7, 8 and 13 obvious.

With respect to the rejection of claims 14 and 15, as discussed previously, it is respectfully submitted that Nakase does not disclose or suggest the feature of “a delay coupled between said plurality of filter blocks and said at least one filter block to delay application of the input signal to said at least one filter block *to skip filtering a portion of the input signal which contains negligible echo.*” In addition, the Patent Office baldly asserts that the features of first plurality of LMS engines and a second LMS engine are “well known in the FIR adaptive filter.” The Patent Office has provided absolutely no support for such an assertion. Consequently, it is respectfully submitted that the Patent Office has failed to establish a prima facie case of obviousness with respect to, for example, claims 14 and 15 of the present application.

Rather, the Patent Office is clearly and unequivocally “rely[ing] solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based,” in complete derogation of the mandates and requirements of the patent laws. [see M.P.E.P. § 2144.03] It is respectfully submitted that the Patent Office is using “personal knowledge” regarding what is supposedly well known in FIR adaptive filters, as the Patent Office has provided absolutely no support for such a bald assertion. As the Patent Office is clearly “relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding.” [M.P.E.P. § 2144.03] Consequently, Applicant respectfully traverses such a use of “personal knowledge,” and requests the Patent Office provide an affidavit or declaration setting forth specific factual

statements and explanations to support such a finding, in accordance with M.P.E.P.

§ 2144.03.

Dependent claims 2, 9-11 and 16 variously depend from independent claims 1, 8 and 15, and are, therefore, patentably distinguishable over Nakase for at least those reasons stated above with regard to claims 1, 8 and 15.

For example, with respect to the rejection of dependent claim 16, the Patent Office baldly asserts that the features of claim 16 are “obvious to a person having ordinary skill in the art.” It is respectfully noted that the Patent Office has completely and utterly failed to provide any support for such an assertion. The Patent Office has failed to provide a reference that supports such an assertion, or any suggestion or motivation for arriving at such a baseless conclusion. Consequently, it is respectfully submitted that the Patent Office has failed to establish a prima facie case of obviousness with respect to, for example, claim 16 of the present application.

Rather, the Patent Office is once again clearly and unequivocally “rely[ing] solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based,” in complete derogation of the mandates and requirements of the patent laws. [M.P.E.P. § 2144.03] It is respectfully submitted that the Patent Office is using “personal knowledge” regarding what is supposedly obvious to a person having ordinary skill in the art, as the Patent Office has provided absolutely no support for such a bald and unfounded assertion. As the Patent Office is clearly “relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding.” [M.P.E.P. § 2144.03] Consequently, Applicant respectfully traverses

such a use of "personal knowledge," and requests the Patent Office provide an affidavit or declaration setting forth specific factual statements and explanations to support such a finding, in accordance with M.P.E.P. § 2144.03.

For at least the foregoing reasons, it is respectfully submitted that Nakase does not render the subject matter of claims 1-2 and 7-18 obvious. Accordingly, reconsideration and withdrawal of these grounds of rejection are respectfully requested.

All of the rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance and a notice to that effect is earnestly solicited. Should the Examiner have any questions regarding this response or the application in general, the Examiner is urged to contact the Applicant's attorney, Andrew J. Bateman, by telephone at (202) 625-3547. All correspondence should continue to be directed to the address given below.

Respectfully submitted,

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